A clinical guide to needle desensitization for the paediatric patient

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A Clinical Guide to Needle Desensitization for the Paediatric Patient

Abstract: Needle phobia is a common problem encountered by dental practitioners and it can pose a challenge, especially in the paediatric patient. Needle desensitization can be used for patients who have needle fear or phobia and help them overcome this by repeated, non-threatening and controlled contacts. This paper will describe an accepted technique of needle desensitization and work through the steps required to achieve a successful outcome of local anaesthesia being delivered in a calm, safe and controlled manner.

Clinical Relevance: Needle desensitization is an effective technique which can be used to enable a needle phobic patient to receive a dental injection.

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Dental anxiety may occur without a triggering stimulus and may be a reaction to an unknown danger, or anticipated due to previous negative experiences. Whilst dental fear is a normal emotional response to objects or situations perceived as genuinely threatening,[1] both are problems which dental practitioners may encounter on a daily basis.[2] Phobia is a clinical mental disorder in which subjects display persistent and extreme fear of objects or situations with avoidance behaviour and possible interference to daily life. Understanding these terms and associated issues allows effective management of both dentally anxious children, who may have a generalized anxiety associated with the dental setting,[3] and dentally fearful children, who have a specific stimulus, for example an injection or needles (trypanophobia), the drill, or the dentist, which precipitate a negative response. These children who present with behavioural challenges and, as stated, a dental phobia diagnosis, exhibit avoidance or extreme fear of dental care when brought to appointments by their parents. Patients should be assessed with an appropriate clinical history. This should include past dental experiences, awareness of dental procedures/problems, previous hospital/medical contact/treatments, and any parental anxieties or contributing social factors.[2] If mistrust of dentists is the presenting problem, it can be helpful to reassure the child that you are there to help; there is nothing to be gained by actually giving the injection before they feel comfortable in accepting it. An assessment tool should also be completed at this appointment, such as the Modified Child Dental Anxiety Scale faces version (MCDASf) (Figure 1), which is a reliable and quick measure of how the child feels and is validated for children who are 8–12 years old.[3,4] Alternative assessment tools are also available for use, for example CFSS-DS[3] and Venham picture scale.[3] These tools, along with a good history and clinical assessment, are all helpful in assessing the extent of the dental management challenge, which then determines the correct pathway to ensure children are seen in the most appropriate setting for their emotional and dental requirements. Some patients may be suitable for a dentist in primary care to address both needs. When children are assessed as having mild or moderate dental fear, and this is supplemented with a MCDAS(f) score of 24/40 or less, and a specific aetiology of needle phobia, then relaxation exercises with needle desensitization can be very effective for the facilitation of dental injections. While other patients, who are assessed with both their history and clinically as having severe fear or dental phobia or with a MCDAS(f)

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For the next eight questions we would like to know how relaxed or **worried you get about the dentist** and **what happens at the dentist**. The simple scale below is just like a ruler going from 1, which would show you are relaxed, to 5, which would show you are very worried.

1. would mean: relaxed/not worried

2. would mean: very slightly worried

3. would mean: fairly worried

4. would mean: worried a lot

5. would mean: very worried

How do you feel about …..					
1. ...going to the dentist generally?	1	2	3	4	5
2. ...having your teeth looked at (check-up)?	1	2	3	4	5
3. ...having your teeth scraped and polished?	1	2	3	4	5
4. ...having an injection in the gum (to freeze a tooth?)	1	2	3	4	5
5. ...having a filling?	1	2	3	4	5
6. ...having a tooth taken out?	1	2	3	4	5
7. ...being put to sleep to have treatment?	1	2	3	4	5
8. ...having a mixture of 'gas and air' which will help you feel comfortable for treatment but cannot put you to sleep?	1	2	3	4	5

/40

Figure 1. MCDAS(f) Pre-Assessment Questionnaire.

score of greater than 24, (dental phobia is consistent with a MCDAS(f) score of 27 or greater) may be better served by being referred to a specialist or consultant in paediatric dentistry or may require referral for psychological assessment by the appropriate local child psychology team prior to, or in conjunction with, dental treatment.

This needle desensitization technique can be used for patients who have needle fear or phobia and help them overcome this by repeated, non-threatening and controlled contacts. This technique is more effective for patients who are information seeking and are willing to engage in the process.[2] Patients who prefer to have less information on procedures may benefit more from either sedation or hypnosis in combination with a relaxation technique.

Pre-procedure

First, the patient needs to be taught to relax and, whilst in this relaxed state, is exposed to each of the stimuli of the hierarchy in turn. The relaxation phase is critical to success, and should be practised at home prior to the needle desensitization visit. This teaching of relaxation only takes 5 to 10 minutes and can be done at the end of the initial assessment visit. A progressive muscle relaxation, starting with the feet and working up the body, coupled with slow controlled breathing, has been regarded by some as the best known technique available.[1] However, many other techniques are readily available, and can be sourced online, from websites such as **http://www.dentalfearcentral.org/**[5] Whilst watching the child it will become obvious if the correct relaxation technique has been chosen. The child, sometimes with parental help, can then work to achieve proficiency in these techniques between appointments. It would be wise to explain and introduce a stop signal, eg raising a hand, as part of the procedure to provide the patient with an element of control. This may be introduced at any stage, however, it is more helpful in the later Stages, 5–7.

Procedure – needle desensitization

The procedure involves a hierarchy of fear-producing stimuli to which the patient is exposed in an ordered manner, starting with the stimulus posing the lowest threat.[2] Adopting a systematic and hierarchical approach can provide the patient with a greater ability to remain relaxed and for self-control in anxiety-provoking situations,[6] such as needle phobia. An example found to be effective is shown in Figure 2. The procedure is written over three sheets of paper which are shown to the

patient only as the procedure is taking place:

Stages 1–3 (page 1) involves showing the child the components of the LA syringe;

Stage 4 (page 2) involves showing the child the assembled components and viewing the needle; and

Stages 5–7 (page 3) involves practising how the patient will cope with having an injection in his/her mouth.

The measurement scale of worry or happiness (depending on how you perceive it) should be explained to the patient, how to use it and, indeed, reassurance given. The child is shown how the line should be drawn at right angles to the scale in the appropriate place that corresponds to how he/she feels. It should be emphasized that two scales are given for each stage as there is an expectation that some phases may require repeating to ensure that the child feels comfortable before he/she proceeds to the next stage. The next stage should *not* be commenced until the current stage scores have reduced, and the patient should be reassured of this. A rough guide to progression may be that he/she scores less than halfway or up to 5/10 on the rating scale. It should be noted that certain stages may require to be repeated on several occasions before the patient will allow for progression. It would be unwise to place a timeframe for the length of time it takes to complete the procedure as each child will understand and adapt at different rates. Some children may complete the entire process in 20 minutes, while the more phobic children, who may require referral, may take up to 2–3 visits. Stage 1–4 is normally completed without dental gloves being worn, which helps reassure many patients as they start this journey.

Stage 1 – Topical anaesthetic (Figure 3)

Topical anaesthetic is shown to the patient either on a piece of cottonwool roll or on a disposable tray liner. There are different ways of communicating to the patient how effective the topical gel is. From an information control viewpoint, many patients like to know the percentage strength of the topical gel and are reassured that it is 20%. In addition to this, knowing why it feels more 'tingly on the tongue' than on the mucosa next to the tooth also reassures

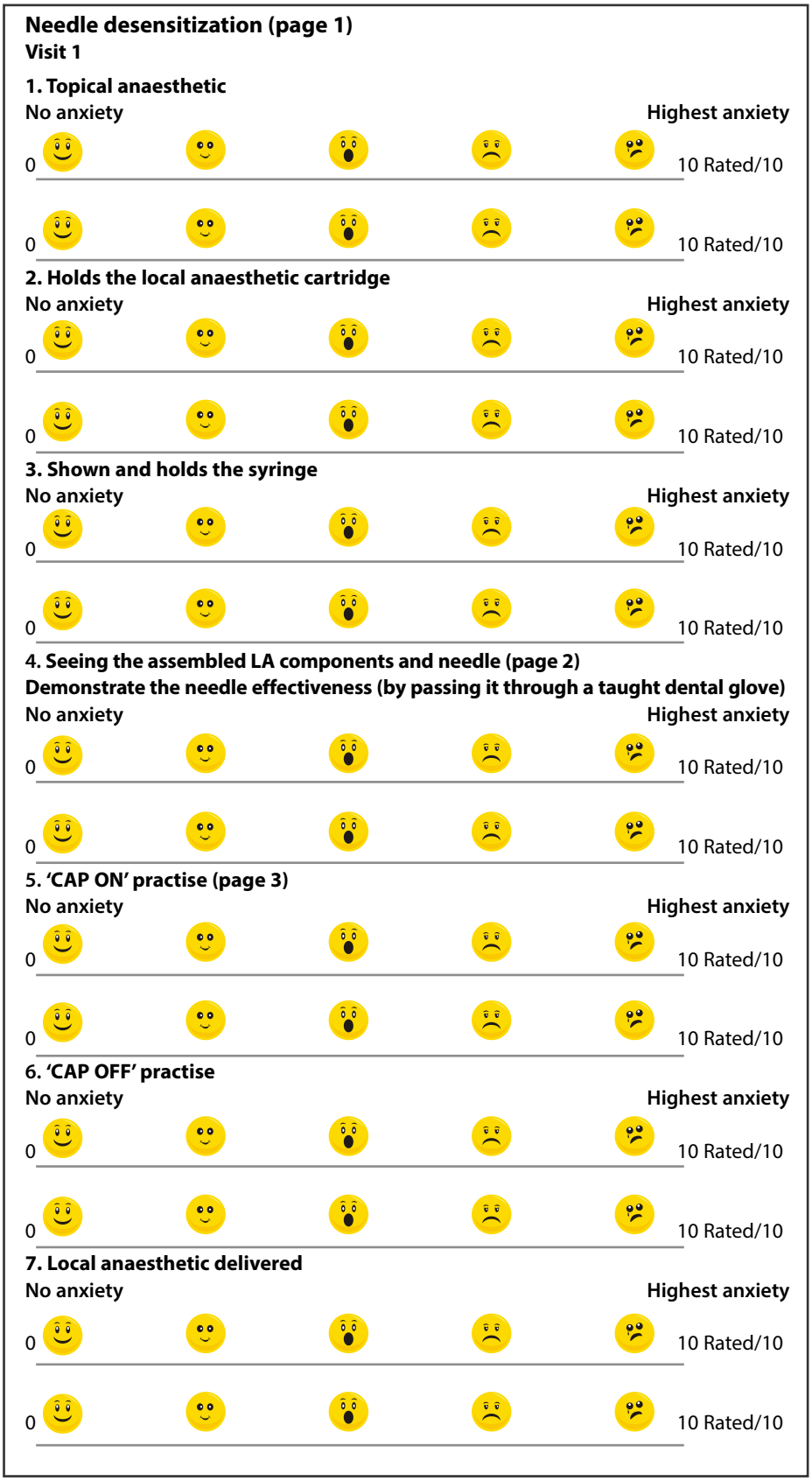

Figure 2. A needle desensitization technique.

the child and stops negative thoughts taking over at Stage 5. Children can apply the gel themselves at Stage 1, either to their tongue or next to their tooth, also enhancing their control over the situation. Children should be asked to score how they feel about this step. Most children score very close to the very happy face end of the scale. Another means of completing this step may be for the dentist to apply the topical gel to the mucosa; this will, however, involve putting on dental gloves, protective apron and glasses. The mucosa should be dried and the topical gel should be held against the tissues for a minimum of 3 minutes, at which point, the gum should feel rubbery and tight. Again the patient should be asked to score how he/she feels about this step.

Stage 2 – Holds the local anaesthetic cartridge (Figure 4)

The patient should be given a cartridge of local anaesthetic. The length of the solution vial should be highlighted (this helps the child realize when everything is assembled that the needle length is not part of the vial or syringe handle). The amount of solution within the glass vial may be discussed, and a comparison should be made in terms that the patient can understand and comprehend, for example, a 2.2 ml vial is equivalent to half of a regular teaspoon of water. Some clinicians may ask the child to warm the solution up by holding it, and therefore bring the temperature of the solution in line with that of his/her own body. The patient should be asked to score how he/she feels about this step. Most children score close to the happy face end of the scale. If this is not the case, ask why and, when a reassuring explanation is given, ask the child to score again on the second scale.

Stage 3 – Shown and holds the syringe handle (Figure 5)

The patient should be given the syringe handle and shown how to move the plunger. It should be described as any other handle used to hold things. The child is again asked to score the scale. Most children again score close to the happy face end of the scale. If they do not, an enquiry as to what concerns them still is helpful. Again, they should be asked to rescore this section and, after any concerns are addressed, their score should be lower.

Stage 4 – Seeing the assembled LA components and the needle (Figures 6 and 7)

The patient and dentist can look and discuss the remaining components required to assemble the syringe. The patient should be encouraged to aid the dentist in making up the syringe; however, some patients will not want to do this. The dentist can demonstrate how efficient and clever the needle is at its job by passing it through a taught dental glove. The child should be encouraged to find the hole in the glove. Children are amazed that the hole is not there. Complete this phase prior to giving the child the assembled syringe as any LA solution on the glove may give away the location of the hole in the taught glove (which is not worn when this is demonstrated). After this, the patient can be given the assembled syringe to handle and asked to push the plunger and deliver some LA into the air. It should be made clear that the size of the assembled syringe is merely to allow the dentist to hold the syringe, and deliver the LA in a safe manner, as it would be very difficult to control the syringe, in a safe manner, were it to be any smaller. The patient should be asked to score how he/she felt about this step. Many children score higher at this stage and, for some, it is purely due to the fact that they are aware that the next stage is about to commence. This should be introduced as a 'let's pretend'. Other children may have different reasons for scoring higher than before, eg seeing the needle, which they can be reassured about and praised at how far they have come. At this stage, if you anticipate Stages 5–7 will be completed all in one go, please discreetly use a newly assembled LA syringe.

Figure 3. The patient is shown the topical anaesthetic.

Figure 5. The patient is shown and is able to hold the syringe handle.

Figure 4. The patient is given the local anaesthetic cartridge to hold.

Figure 6. The patient is shown the assembled syringe.

Figure 7. The patient is encouraged to hold the syringe.

Stage 5 – The 'CAP ON' practise (Figure 8)

After putting the chair back and before you do anything, ask the patient to carry out the relaxation exercise they have practised, which helps them feel calm and in control. It is helpful if positive self-talk is also confirmed at this stage. In a 'let's pretend' age appropriate manner, the topical gel is applied next to the tooth that requires treatment. The three minutes that is required for the topical gel to work can be utilized, ensuring that the child is relaxing. The patient should be encouraged at this point to have the syringe, with the plastic cap still covering the needle, placed next to the mucosa. There are differing time frames allocated for this, ranging from counting to 10–30 seconds. The chair is then put upright and the child congratulated on completion of this step. The child is then asked to score on the scale how he/she feels. Most are amazed that they coped and that they felt as relaxed as they did. Compared to Stages 1–3, scores are higher and closer to 5/10 at this stage. At this point, asking the child what is the difference between Stages 5 and 7 can be helpful. Some will think about this and eventually reply, nothing, as topical gel is used and they will therefore not experience pain. While others may say that, in Stage 7, the needle actually goes in. However, for all patients, a reinforcement of their ability to stay in control, to feel comfortable and calm and the benefits of topical gel is re-emphasized. At this point, the child is offered a second practise to reaffirm that the first practise was not just luck. After this the score has normally reduced, which will give the child a confidence boost.

If the patient refuses to allow the capped needle to go straight to the mouth, you could start by asking the patient to touch the cap with his/her hand, and then work towards the mouth via the arm, elbow, shoulder, chin, lip, teeth and then mucosa. The syringe should be held in each position for at least 30 seconds. The patient should again be asked to score how he/she felt about this step and reassured as above. As previously discussed, if mistrust of dentists is the presenting problem it can be helpful to reassure the child as there is nothing to gain by actually giving the injection before he/she is ready or agrees to this. Indeed, you have no plans to waste the child or parent's time or even your own. If you were to do this is would also ruin the progress you have all made.

Figure 8. The patient is encouraged to adopt his preferred relaxation technique, and the syringe is held next to the tissues with the CAP ON.

Stage 6 – The 'CAP OFF' practise (Figure 9)

After putting the chair back, and again before you do anything, ask the patient to practise the relaxation exercise that helps him/her feel calm. It is helpful if positive self-talk is confirmed again. In a 'let's pretend' manner, the topical gel is reapplied next to the tooth that requires treatment. In the three minutes that is required for the topical gel to work it can be useful to ensure that the child continues to relax. Reassure the child that this is just a 'let's pretend' and that you are there to help. The syringe should be placed next to the mucosa, with the needle exposed, and the cap off. The patient should be reassured that the needle will not touch the mucosa, and this must be upheld, as any breach of trust will undo the entire process of desensitizing the patient. The syringe should be held in position for 10–30 seconds, depending on what has been agreed, while the child practises the relaxation technique. The chair should then be moved to the upright position and the patient should be asked to score how he/she felt about this step. Many children may score in the middle to lower end of the scale. If higher than this, ask why and reassure as required. Ask the child if he/she would like to practise this again or go on to Stage 7. Many children will be very apprehensive regarding the transition from Stages 6 to 7. Again ask them what the difference is, as above, between the stages. Some will answer none while others will still be apprehensive about the needle going into their mucosa. A second CAP OFF 'let's pretend' practise may be required.

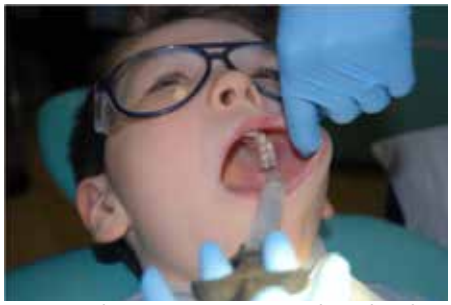

Figure 9. The patient is encouraged to adopt his preferred relaxation technique, and the syringe is held next to the tissues with the CAP OFF.

Stage 7 – Local anaesthetic delivered (Figure 10)

Prior to starting this stage, it is beneficial to summarize what the child has gone through to get to this stage, eliminating any remaining fears. In a confident manner, the LA should be delivered via the taut mucosa, which has previously been treated with a topical anaesthetic while the child practises relaxation. At this point, the patient should be praised on completing a safe and effective delivery of a local anaesthetic solution. Again the child should be sat upright, congratulated and make a score on the scale.

For more phobic children, there are two main methods which are useful to get to Stage 7 from Stage 6. Method one involves betting the child that, in Stage 7, when you count to ten, you are sure they will NOT know at which point you give the injection, thereby utilizing a distraction technique to aid the delivery. After administration of the local anaesthetic and when the child is again sitting upright in the chair, the child can guess when the injection was given and is then told by the dentist when it was delivered.

Figure 10. The patient is encouraged to adopt his preferred relaxation technique, and the local anaesthesia is delivered in a safe and controlled manner.

The bet has never been lost while using this technique. If the child is not keen for the first approach, then the second method involves informing the child, before starting Stage 7, that if they put their left hand up, then Stage 7 turns into a Stage 6, and they have already proven that they are very good at coping with Stage 6. A demonstration of which hand should be raised is given by the patient and then Stage 7 starts with relaxation and topical gel placement and administration of the local anaesthetic. Only a few children have ever put their left hand up. Either way, the child should be sitting upright, congratulated and asked to mark a score on the scale.

Conclusion

Needle desensitization is a simple and straightforward technique which can be carried out by any dental practitioner. By utilizing this technique, or indeed modifying it to suit the patient's needs, you can help the patient overcome his/her fear/phobia of needles in the mouth in a safe and timely manner. Investing time with these patients will stop the reinforcing pattern of avoidance of dental injections and further increased fear/phobia. This needle desensitization technique helps empower these patients with the knowledge and subsequently the belief that they can accept treatment under local anaesthesia. This strengthens the relationship between the patient and dentist. This will also enable treatment to be undertaken in the future for patients who will be delighted with their new ability to cope and accept dental injections.

Acknowledgement

We would like to thank the patient who consented to have this series of photos taken. He sat for these photos having only a few weeks earlier completed Stage 7 himself (having not won the bet). He agreed to these photos, happy to 'be famous' and also to ensure that other dentists are able to help children who, like himself, have worried about receiving an injection in the mouth for over two years.

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